

NAME:

DATE:

## Unit-2 Mastery Assessment (version 607)

### Question 1 (10 points)

Let  $f$  represent a function. If  $f[38] = 30$ , then there exists a knowable solution to the equation below.

$$y = \frac{f[8x - 18] - 12}{2}$$

Find the solution.

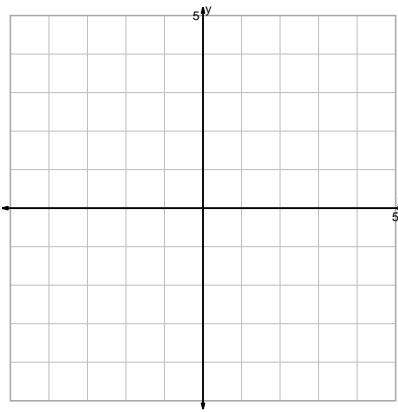
$$x =$$

$$y =$$

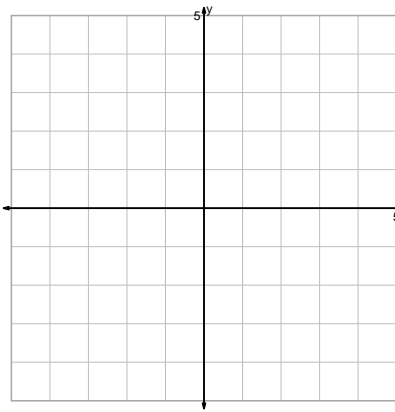
### Question 2 (20 points)

Graph the equations accurately. For each integer-integer point on the parent, indicate the corresponding point precisely. Also, with dashed lines, indicate any asymptotes.

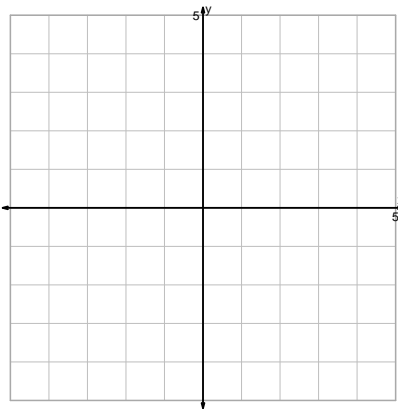
$$y = x^3 - 2$$



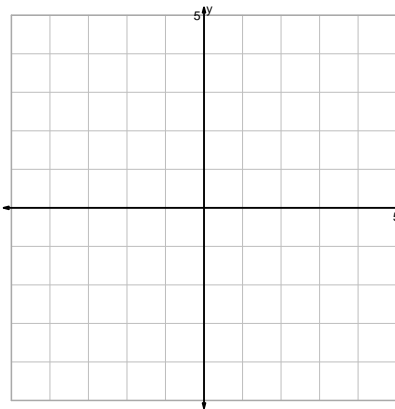
$$y = \sqrt[3]{\frac{x}{2}}$$



$$y = 2^{2x}$$

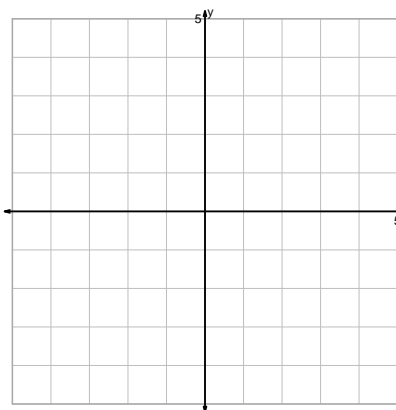


$$y = 2 \cdot \sqrt{x}$$

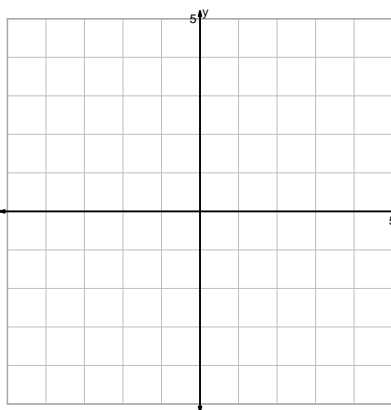


Question 2 continued...

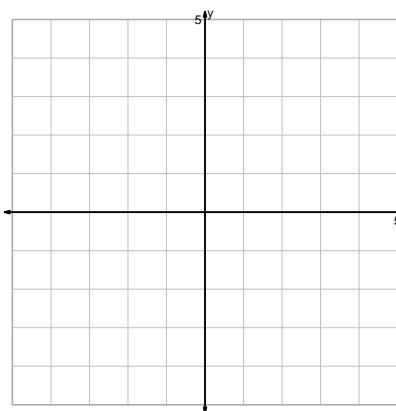
$$y = \sqrt{-x}$$



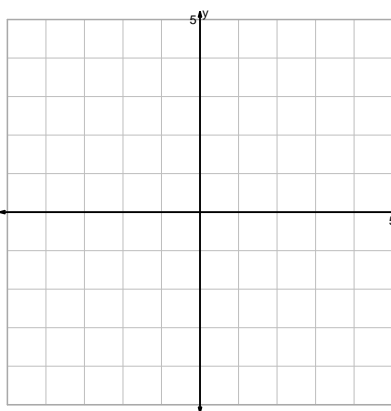
$$y = (x - 2)^2$$



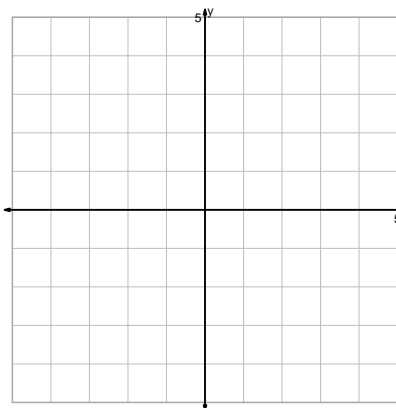
$$y = \frac{x^3}{2}$$



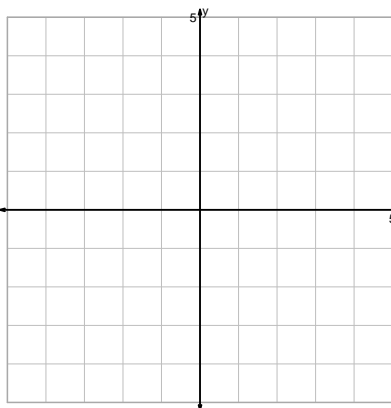
$$y = x^2 + 2$$



$$y = \sqrt[3]{x+2}$$

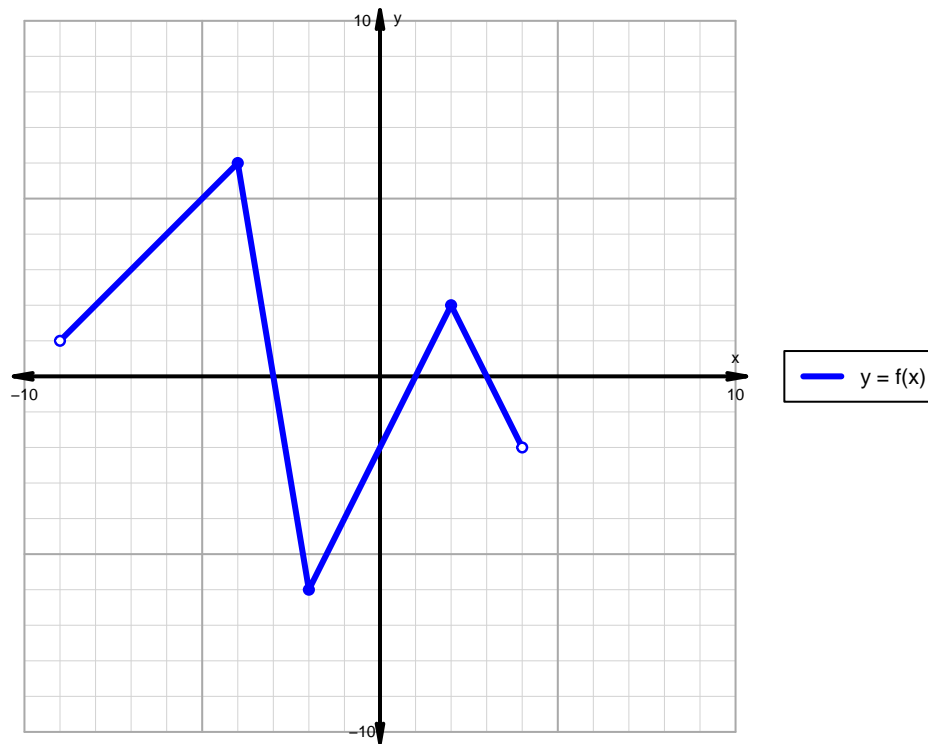


$$y = -2^x$$



### Question 3 (20 points)

A function is graphed below.



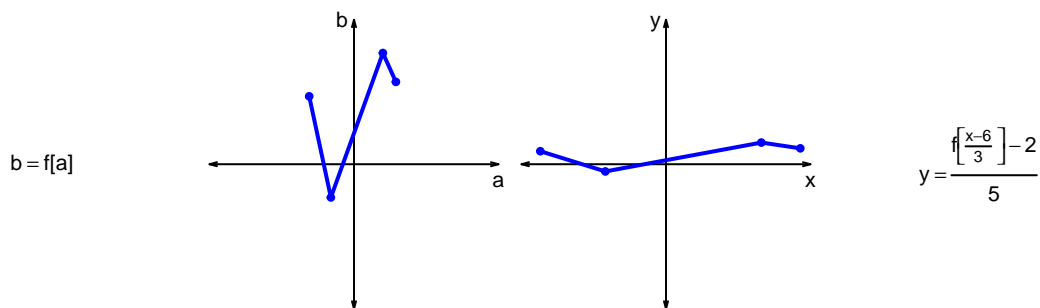
Indicate the following intervals using interval notation.

Feature	Where
Positive	
Negative	
Increasing	
Decreasing	
Domain	
Range	

**Question 4 (20 points)**

Let  $f$  represent a function. The curves  $b = f[a]$  and  $y = \frac{f\left[\frac{x-6}{3}\right]-2}{5}$  are represented below in a table and on graphs.

a	b	x	y
-31	47	-87	9
-16	-23	-42	-5
20	77	66	15
29	57	93	11



a. Write formulas for calculating  $x$  from  $a$  and calculating  $y$  from  $b$ . (Or, write the coordinate transformation formula.)

b. What geometric transformations (using words like translation, stretch, and shrink), and in what order, would transform the first curve  $y = f[x]$  into the second curve  $y = \frac{f\left[\frac{x-6}{3}\right]-2}{5}$ ?

### Question 5 (10 points)

A parent square-root function is transformed in the following ways:

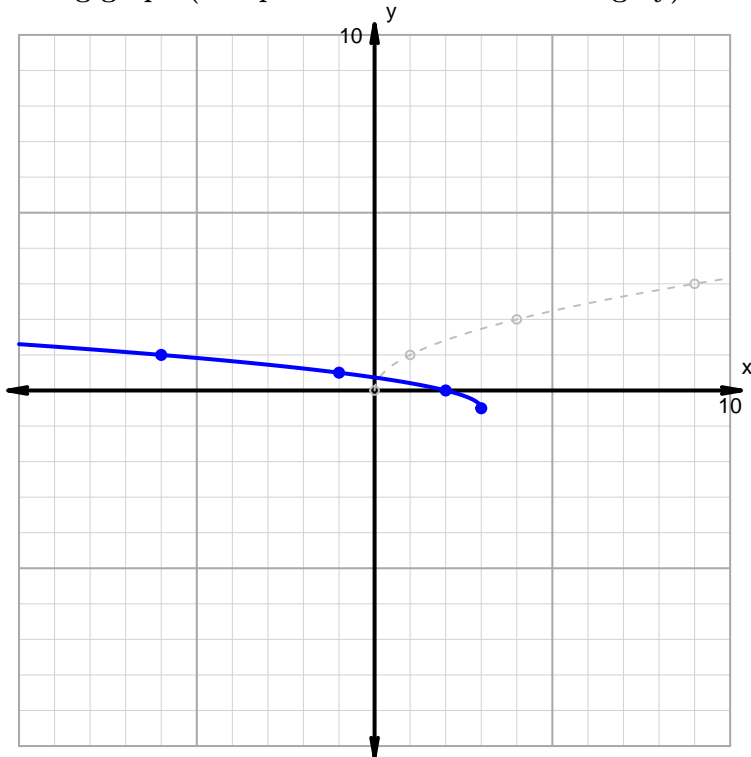
#### Horizontal transformations

1. Horizontal reflection over  $y$  axis.
2. Translate right by distance 3.

#### Vertical transformations

1. Translate down by distance 1.
2. Vertical shrink by factor 2.

Resulting graph (and parent function in dashed grey):

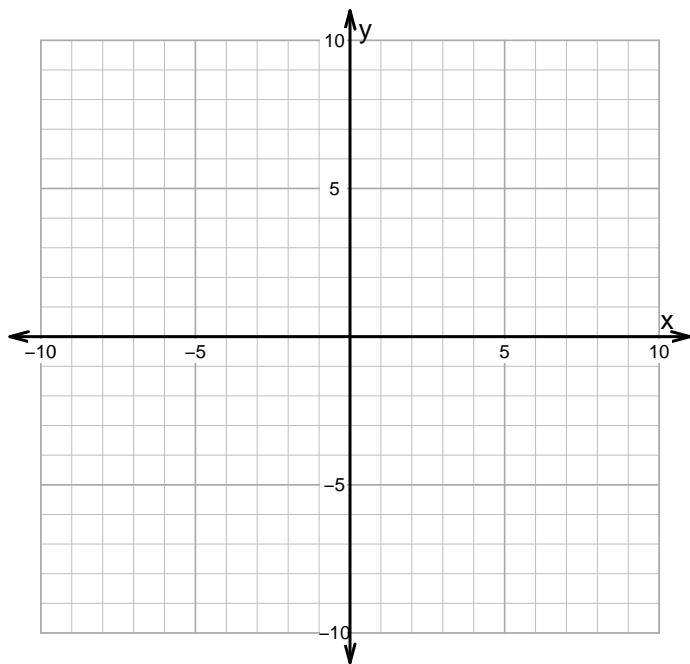


- What is the equation for the curve shown above?

**Question 6 (20 points)**

Make an accurate graph, and describe locations of features.

$$y = 3 \cdot |x + 3| - 3$$



Feature	Where
Domain	
Range	
Positive	
Negative	
Increasing	
Decreasing	